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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,944	11/14/2003	Takaei Sasaki	101136-00103	7420

7590

04/22/2004

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EXAMINER

KORNAKOV, MICHAIL

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/706,944

Applicant(s)

SASAKI ET AL.

Examiner

Michael Kornakov

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/361,158.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/14/2003</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because the abstract is drawn to reflect the invention of the "method", while the instant claims call for the apparatus. Correction is required. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 19 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 19 and 20 are rejected as because they contain such long recitations or unimportant details that the scope of the claimed invention is rendered indefinite thereby. Claims are rejected as prolix because they contain long recitations that the metes and bounds of the claimed subject matter are not readily ascertainable. See MPEP 2173.05(m).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless -

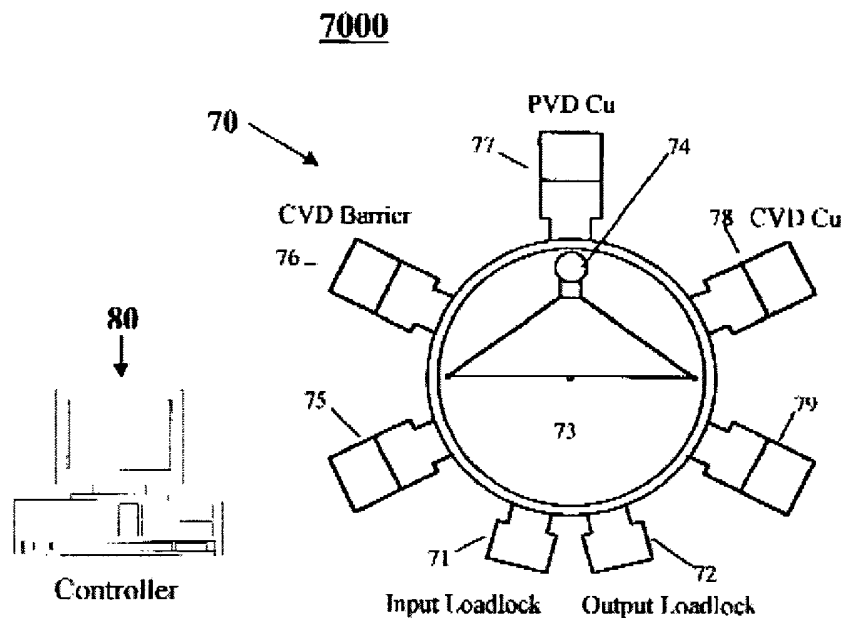
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Cohen (U.S. 6,610,151) or by Loan (U.S. 6,296,711).

In Cohen: FIG. 7 shows a schematic (not to scale) top, view of a cluster tool apparatus, and a frontal view of its controller (e.g. computer), in accordance with a preferred embodiment of the invention. The apparatus is used for dry etching.

Therefore, all the limitations of Apparatus of claim 19 are met by Cohen.



In Loan: A system for governing the supply of various precursors to a cluster tool 120 having one or more vaporization chambers 26 is illustrated in FIG. 2c. A cluster tool controller 802 is controlled by a programmable host computer or data processor 804, which sends high-level commands to a process module to govern the deposition process, including regulation of the delivery of precursors 806, 808, 810 for the deposition of titanium nitride, copper, and aluminum, respectively, for example. The cluster tool controller 802 is further programmed by the host computer 804 to regulate a pair of modules for annealing/diffusion 812, 814 and a separate module for pre-heating and pre-cleaning 816. Communication between each of these modules 806, 808, 810, 812, 814 and 816 and the cluster tool controller 802 is facilitated by a bus architecture. The apparatus is used for dry etching process.

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The configuration and nature of the substrate worked upon by the apparatus claimed in this invention is not patentable in view of *In re* Young (25 U.S.P.Q. 69, 71 (CCPA 1935)) and *In re* Rishoi (94 U.S.P.Q. 71,73 (CCPA 1952)). The Court of Customs and Patent Appeals stated in *In re* Young that inclusion of material worked upon by a machine as element in claim may not lend patentability since claim is not otherwise allowable. Similarly, the Court of Customs and Patent Appeals stated in *In re* Rishoi that there is no patentable combination between a device and the material upon which it works.

Thus, it is irrelevant that Cohen and Loan fail to specifically teach the usage of applicant's claimed process in their apparatus since the apparatus taught by Cohen is clearly capable of conducting applicant's claimed process.

Claim Rejections - 35 USC § 103

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

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the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen or Loan (each one individually) in view of Ke et al (U.S. 6,284,093) and in view of Hasegawa et al (U.S. 5,554,249).

Cohen and Loan applied above applied fail to disclose the following aspects of applicant's claimed invention:

- the specific usage of four electromagnets which surround the etching chamber, and produce a magnetic field which can rotate in a plane parallel to a substrate when a low frequency current which is 90 degrees out of phase is applied to the electromagnets; and
- a transport robot which can be used to transport the wafer to, and from the transport chamber.

Ke et. al. teach that it is desirable to employ four electromagnets which surround etching chamber to produce a magnetic field which can rotate in a plane parallel to a substrate to be etched in order to enhance the uniformity of the etching across the face of the substrate to be etched. They form the magnetic fields by applying to the electromagnets coils a low frequency current which is 90 degrees out of phase. This is

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discussed specifically in column 15, and discussed in general in columns 1-26. This is shown specifically in figure 9, and shown in general in figures 1-11.

Hasegawa et. al. teach that it is desirable to use a two jointed transport robot with two knots to move a wafer between a transport chamber, and a etching chamber. This is discussed specifically in columns 3-8, and discussed in general in columns 1-12. This is shown specifically in figure 7, and shown in general in figures 1-8.

It would have been obvious to one skilled in the art to employ the electromagnetic field generation means taught by Ke et. al. in the apparatus taught by Cohen or Loan I. based upon the suggestion of Ke that it is desirable to do so in order to enhance the uniformity of the etching of a substrate.

It would have been obvious to one skilled in the art to employ the robotic transport, and load-lock chamber means taught by Hasegawa et. al. in the apparatus taught above based upon the suggestion of Hasegawa that it is desirable to do so to enhance the through put of wafers to be etched in the apparatus taught above.

8. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grill "Plasma in Materials Fabrication", IEEE PRESS, 1993, pages 105, 110, 114 (hereinafter referred to as Grill).

Grill describes cluster tool apparatus for dry etching shown in Fig.4-22, which contains multiple process modules that are arranged around the central core, wherein each processing unit can have its own control system.(pages 110,111). Grill does not specify that the control can be a computer control. However, automation of a previously

known operation by use of a conventional control is within the skill of those ordinary skilled in the art, *In re Venner*, 120 USPQ 193 (CCPA 1958).

With regard to claim 20, Grill describes the cluster tool, having multiple processing units, such as etching chamber, substrate holder (cassette), as discussed above, and further shows the arrangement of four electromagnets, each made of a ring-like coil arranged at 90°, and provided on the outer side of the chamber (see Fig.4-20 on page 108). With regard to the transport robot, the central handling platform (Fig.4-22 on page 111) can be very well computerized as being a transport robot, and is such computerization is within the skill in the art, as discussed above.

Thus, it is irrelevant that Grill fail to specifically teach the usage of applicant's claimed process in their apparatus since the apparatus taught by Grill is clearly capable of conducting applicant's claimed process.

9. Other prior art cited in PTOL-892 shows the general state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. Kornakov

Michael Kornakov
Examiner
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04/17/2004